January 24, 2001

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ALTERNATIVE STOCK WATERING SYSTEMS

FINAL REPORT

A WATER QUALITY/QUANTITY IMPROVEMENT PROGRAM

SUBMITTED TO:

US FISH AND WILDLIFE SERVICE

ID # 319h-V-06

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ABSTRACT:
The Scott River Watershed has been listed as an impaired water body by the North Coast Regional Water Quality Control Board (NCRWQCB). The listed water quality impairments of the Scott River are excessive water temperature and high sediment levels. The Siskiyou Resource Conservation District (RCD) believes the two impairments adversely affect each other. Some of the Scott River watersheds' high water temperatures are derived from excessive sediment contribution. Stream systems which have excessive sediment levels are often characterized by having unstable channels, braided channels, channels possessing poor width/depth ratios and channel aggradation. These are the same factors which make a stream susceptible to increased water temperatures.

In order to improve water quality conditions, the RCD decided to focus on eliminating factors that impact both water quality impairments (excessive sediment and temperature). The RCD has completed the construction and implementation of one complete alternative stock watering system, and the improvement of two other systems. We constructed a total of 8,800 feet of riparian fencing along lower Patterson Creek, Kidder Creek and the Scott River in order to protect and enhance the riparian area. The RCD also developed and conducted a riparian survey sheet which quickly determines survival rates and the vigor of plantings. The goal of the project was to protect the riparian area and allow native and riparian plantings an opportunity to become established in order to provide riparian cover and trap sediment already in the stream.

INTRODUCTION:

The Siskiyou Resource Conservation District (RCD) is a special district run by a board of property owners who are addressing the issues related to resource use within the Scott River watershed. The RCD has focused mainly on the floor of Scott Valley which has been dominated by agricultural use for over a century. Agriculture within Scott Valley focuses on dairy, beef cattle, wheat, and alfalfa production. The Siskiyou RCD searches for project designs which conserve the use of resources as well as improve management of property and livestock. We have found that projects which serve mutual benefits, or produce no negative impacts to the property owner, are permanent projects as the property owner is more eager to take over the required maintenance.

The current issue related to resource use revolves around anadromous fisheries and watershed health. The population of anadromous fisheries has generally declined throughout the Pacific Northwest during the past several decades. Academia has found that water quality is one of the limiting inland factors related to declining salmonid populations. The North Coast Regional Water Quality Control Board (NCRWQCB) has listed the Scott River has having two non-point source water quality impairments: excessive sediment and temperature levels at certain periods of the year.

So where do we start when attempting to improve water quality? Most feel a reduction in water temperature is more important and should be the first impairment to correct. The RCD has come to realize that the source of temperature increase is caused largely by the symptoms of excessive bed load. Upland property owners and managers, the Siskiyou RCD and Scott River Watershed Council (SRWC), are already collectively working to reduce upslope sediment sources and have changed many methods of operation in recent times. In addition, harvesting regulations as well as road construction specifications and design have limited the potential sources of sediment contribution. The upslope interests are identifying the remaining sources and are attempting to correct them. The solution to the excessive bed load and sediment already in the stream systems has not been dealt with at this point and must be considered as it may take decades or centuries to pass through the watershed.

MATERIALS, METHODS AND RESULTS:

Alternative Livestock Watering Systems:

Restoration projects within the floor of Scott Valley include riparian fencing, bank stabilization, of fishery habitat improvement structures, replanting the riparian zone, and improving water use efficiency. This "holistic" approach includes practices that reduce high sediment levels and water temperatures within streams used by anadromous fish. It does not identify an alternative "off-site" (outside of the stream corridor and riparian zone) source for watering livestock which will eliminate the need for livestock to enter the riparian area.

The lack of alternate watering sources appeared to be the limiting factor that would reduce the scope of a holistic restoration approach throughout the watershed. If the RCD could provide an off-site watering source, many property owners who own livestock would agree to management changes within riparian zones and/or use water efficient stock watering strategies on their property. Because only "indirect" benefits are gained by installing off-site watering systems, fisheries improvement funding sources have not been interested in funding such projects.

The practice of developing an off-site watering system has been termed the Alternative Livestock Watering System (ALWS) by the RCD and the SRWC. The ALWS is now the catalyst for development of new restoration programs. A livestock watering system which meets the landowners' management needs is a permanent solution to excluding or intensively managing cattle within riparian zones and/or increasing surface flow by reducing the need for diverting water for watering livestock. The increase in flows can reduce water temperatures and allows adult Chinook salmon to access and utilize the prime spawning and rearing areas located in the upper portion of Scott Valley (Horn Lane to French Creek).

A typical alternative livestock watering system is designed and installed during the winter when stock water is plentiful and no irrigation will be taking place. The projects are designed to gain the maximum benefit for the least cost. A typical stock water system uses an existing well as its source of ground water. A small submersible pump is installed in the well casing. The pump size ranges from 3/4 to 1 1/2 horsepower depending on the number of troughs, the distance between pump and troughs and whether or not the system will double as a riparian revegetation irrigation system. A large pressure tank, pressure switch and a pressure sensor accompany the submersible pump. The system is similar in design system installed in homes. The pump system is inside an insulated pump house with a concrete foundation.

Water is transported through schedule 40 PVC pipe ranging in size from 3/4" to 1 1/2" in diameter. Pipe diameter is determined by a sliding scale that takes increase in elevation, length of run and desired flow volume at source into account. Friction draw-down inside the pipe is a major loss of pressure and flow volume over a long distance.

Troughs are also supplied by the RCD. The number of troughs and size depends on the number of livestock using the system and the management style related to cost/ benefit. The flow to the troughs is activated by a float valve which conserves water and power by eliminating the need for continuous flow. Frost free hydrants are used to reduce the chance of frozen pipes during winter weather.

Stock Watering Projects completed with this funding include a project that provided fencing and a stock watering system that affected the main stem of the Scott River from Horn Lane North to Young's point. We provided a stock watering system in order to eliminate the need for livestock to enter the riparian area. We varied from the typically used pump by experimenting with a 2 horsepower variable speed pump which eliminated the necessity of the pump house, concrete foundation and pressure tank. Over 4000' of 1" and 1 ¼" diameter PVC pipe was buried 30"-36" deep in the soil to connect the pump to the troughs. Three (3) troughs were purchased to keep approximately 200 head of cattle out of the riparian area. The project eliminated the need for livestock to enter the riparian area and also will act as a watering source for riparian plantings (Scott River Riparian Planting Project II).

A second system located on the main stem of the Scott River at the confluence with French Creek was improved. Much of the system was installed by the property owner several years ago. A pressure tank system was installed to increase the pressure and reduce the stress on the pump. The increased pressure allows water to be pushed further up the property owners hill (On East side) and can replace the landowners stock water use from the Farmers Ditch.

A third system was completed using a trial method for reducing the affects of livestock concentration around the watering tanks. When livestock concentrate in an area, they create a

"mud hole" which spreads disease and increases tank rust and equipment failure. Rubber stall mats were purchased as ground covering under and surrounding the tanks. The tank was elevated using a bed of sand/gravel to provide a slope to increase drainage. This method is an alternative to cement, which is very costly, and permanent. We noted significant financial savings by choosing rubber mats versus concrete pads and will monitor the long term results.

The majority of funding for these ALWS came from this project, with a small percentage from the Scott River Riparian Revegetation II Project (National Fish and Wildlife Foundation funding) because of its benefit to providing irrigation to riparian plantings.

Fencing:

Approximately 4500' of riparian fencing has been installed along the lower portion of Kidder Creek near the confluence with the Big Slough. The fencing was installed to protect the riparian area in order to improve riparian and channel conditions along Kidder Creek. Natural regeneration has been limited by uncontrolled grazing. The lack of riparian root strength and increased bed load has allowed the channel of Kidder Creek to become unstable, excessively wide and flat. Riparian fencing was proposed for the area to eliminate future damage caused by livestock and allow natural revegetation to occur. There are positive signs throughout the riparian area that natural revegetation will occur rapidly. The riparian area ranges in width from 150' to over 500'.

An additional 2000' of fencing was constructed along the Scott River above the Horn Lane Bridge. The width of the riparian area ranges from 300'-700'. The riparian area was planted during the springs of 1999 and 2000 (Scott River Riparian Restoration II) and again in 2002. Management changes made the fence necessary to protect the riparian area, the stream banks and salmon redds from livestock.

2300' of riparian fencing was installed along Patterson Creek located approximately .5 miles above the confluence with Johnson Creek. Riparian area width is approximately 70'. This fencing was installed to exclude the livestock from entering Patterson Creek. Previous projects and currently funded projects will exclude all livestock from Patterson Creek except for one small property owner. A total of 8,800 feet of fencing was constructed including all three projects. All sections of fence were completed following NRCS fencing specifications. The fences were constructed with five wires, heavy duty T-posts spaced at 15 feet. Cedar was also used for the structural bracings, as it seems to have the longest life span. In high risk flood areas, the wire closest to the ground was raised to 20" above ground level to reduce the chance of flood debris destroying the fence.

The wide riparian areas were established with the understanding that limited grazing could occur within the reach but must be controlled and cannot occur until riparian species have established and a grazing plan is in place. The participating property owners are diligent about grazing assessment, livestock removal timing, and understand the importance of riparian systems. Riparian grazing cannot occur until an acceptable riparian grazing plan has been developed by the RCD, NRCS and the UC Extension Office.

The RCD has found that total livestock exclusion allows infestation of noxious weeds and ground cover that protects rodents (which girdle trees) from prey. An opportunity to minimally utilize the riparian area for grazing under a riparian grazing plan improves potential cooperation,

increases the width of the riparian area, reduce noxious weed infestation, limits ground cover that protects rodents, and can be done with little to no adverse affects.

KRIS Development:
The development of KRIS has been largely handled through other programs and projects which are currently active in the Scott River Watershed. Much of the temperature data has been handled through the Scott River Temperature Monitoring programs. The RCD has worked with Carlin Finke of HSU-GIS Project to identify previous project locations and accomplishments and place them on a map layer that can be available to KRIS. Unfortunately, our employee that managed KRIS, Lorie Bundy, left the RCD early in 2000. Her second replacement is beginning to learn KRIS but is having problems with the operations of KRIS on our current version.

Riparian Monitoring:
Riparian monitoring was implemented by means of a survival rating guide (attached). Using a 1-5 scale, plants are scored accordingly:

DEAD or

ALIVE
1 = Tree is less than 8" tall with less than three main stems.
2 = Tree is less than 8" tall with more than three main stems.
3 = Tree is over 8" tall with several main stems.
4 = Tree is knee high with several main stems.
5 = Tree is hip high or over with several main stems.

By using an inventory rating sheets for each planting sites, we can then tabulate each score and calculate not just survivability, but also extent of growth. This scoring system also allows us to determine if mortality is greater in certain types of soils or conditions. This knowledge will allow us to be more efficient in future planting operations and provide higher percentages of survivability. The RCD inventoried all sites which were planted during the spring of 2000 and most of the sites planted during the spring of 1999. A second goal is to determine survival rate and growth change over the first and second year in numerous locations over time. This quick yet fairly active method will provide quantification and cross referencing potential which will help us determine the long term success of our current planting style. Our survival rate for this springs plantings ranged from a low of 41% in poor planting conditions to 100% at one site. The second year of monitoring varied about the same as the first year with a low of 34% to a high of 96%. Further tabulation and data interpretation will occur in the Scott River Riparian Restoration II final report, which funded a large portion of the riparian planting.

SUMMARY AND CONCLUSIONS:
The Scott River has some considerable water quality issues to consider in the future. However, the members of this community have stepped forward and took responsibility of watershed issues. The Scott River Watershed Council (SRWC) and the Siskiyou Resource Conservation District have focused on providing education opportunities for the community. Through education, management changes and opportunities for conservation projects have arisen and will continue to occur. The ability to provide off site watering sources (other then a stream) reduces

the need for livestock to enter the riparian area and allows riparian fencing/riparian revegetation projects to occur. As we gain further information and trends with specific areas of the watershed, we will be able to reenter livestock which will increase the widths of riparian areas. This process is a long term process and continued cooperation with property owners will likely be our only measurement of change for the short term. On the other hand, cooperation with the community is the only opportunity for measurable change in the long term.

Recommendations for further water quality improvements efforts:
Recommendations for addressing both temperature and sediment impairment include: expanding the fencing of riparian corridors and providing ALWS where water savings or riparian protection is ensured. Expanding the scope of the project to include increased areas along the river and creeks will substantially improve the water quality issues we are dealing with.

Recommendations for sediment impairments exclusively include:

- Continued identification and reduction of sediment sources and bed load sources
- Measures to improve the width/depth ration of channels that are not sufficiently transferring bed load and sediment. This will help flush the sediment already in the system.

Recommendations for temperature impairment exclusively:

- Identify potential to increase flows in the stream during the summer months by determining the existing carrying capacity of vegetation levels.
- Increase flows in the stream by reducing ditch loss in some locations, and reducing livestock watering via diversions.

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January 23, 2001

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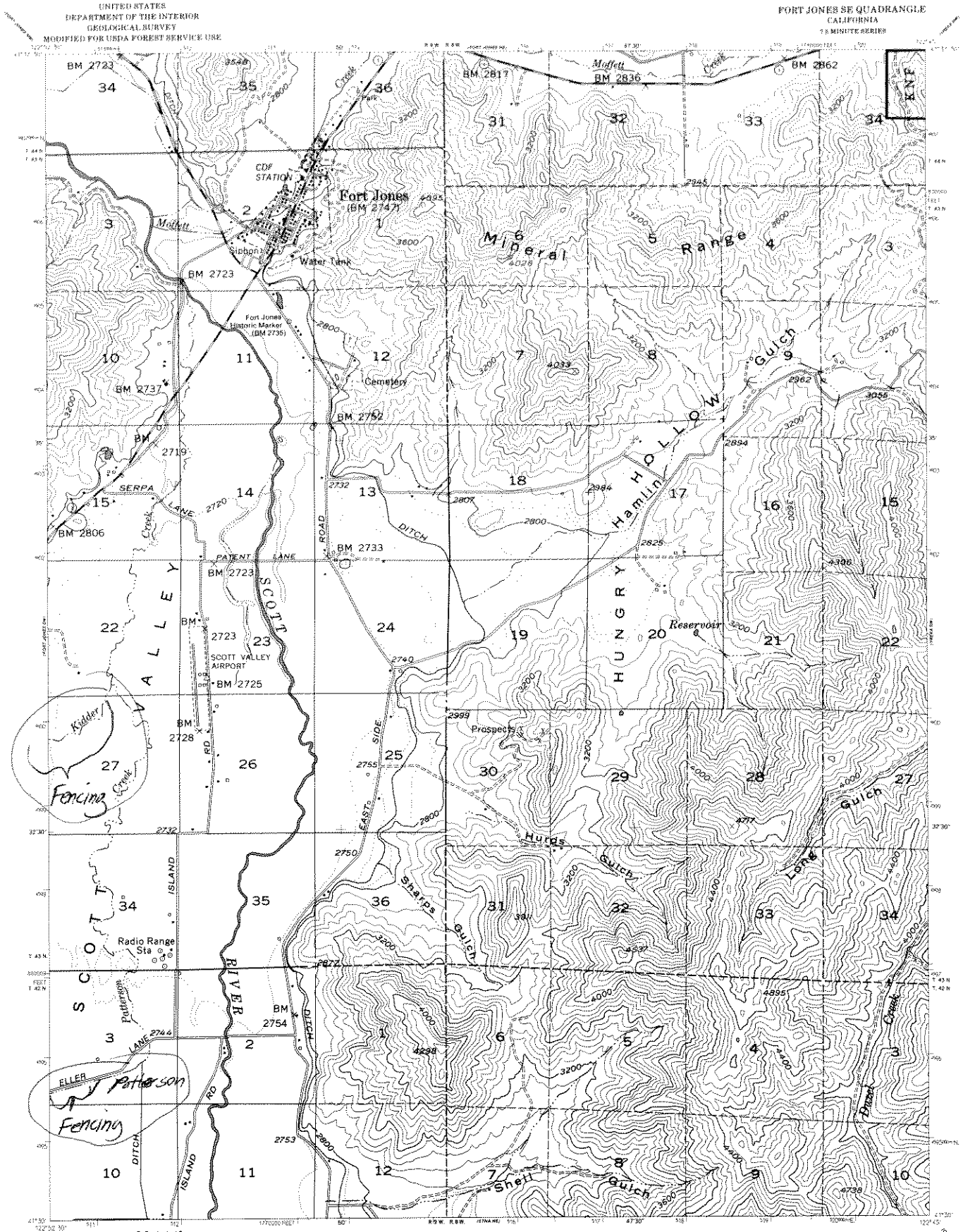
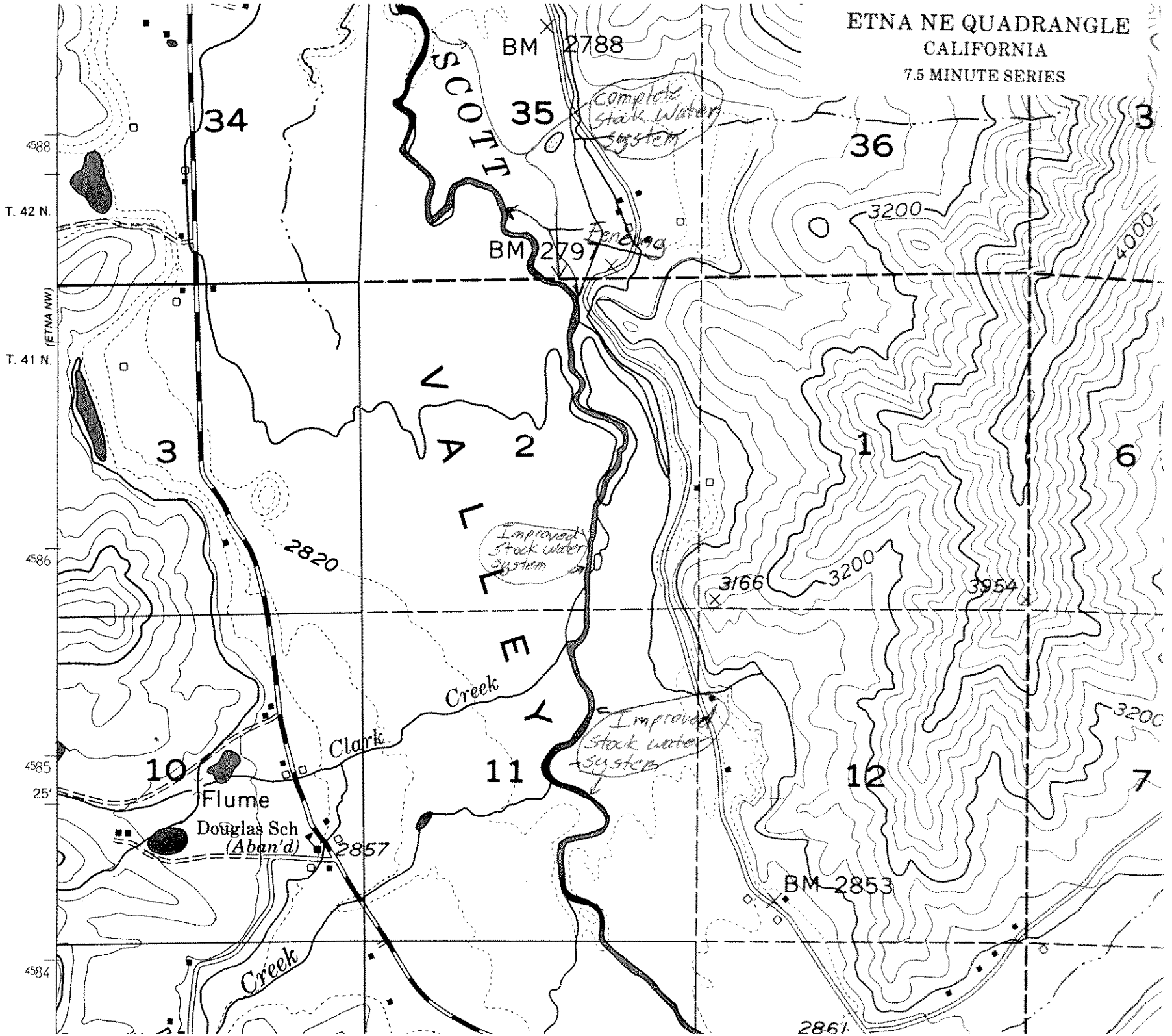
Improve Stock Watering System
Agreement # (319 h) -VI-02
(RCD ref. # 85 VI)

	Budget	Budget Readjustment	Final Budget	Amount Remaining
a. Salaries (including benefits)	16,031.20	(1,661.70)	14,369.50	-
b. Operations				
1. Travel	94.60	75.56	170.16	-
2. Equipment (incl. Hardware and software)	550.00	(320.52)	229.48	-
3. Supplies, expendables, printing, misc.	6,074.20	1,906.66	7,980.86	-
Total	22,750.00	-	22,750.00	-

In-kind:	
Labor 27 hours @ $11.00/hr	297.00
Tractor 4 hours @ $35.00/hr	140.00
Total In-kind	437.00


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
MODIFIED FOR USDA FOREST SERVICE USE
FORT JONES SE QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES
Fort Jones
(BM 2747)
CDF STATION
Siphon
Water Tank
Fort Jones Historic Marker (BM 2736)
Cemetery
Mineral
Range 4
Moffett
BM 2817
BM 2862
BM 2836
BM 2723
BM 2737
BM 2719
BM 2752
BM 2806
BM 2733
BM 2725
BM 2728
BM 2754
SERPA LANE
PATENT LANE
SCOTT VALLEY AIRPORT
Radio Range Sta
Reservoir
Prospect
Kidder Creek Fencing
Patterson Fencing
SCOTT RIVER
SCOTT VALLEY
HUNGRY HOLLOW
Hamlin Gulch
Hurds Gulch
Sharps Gulch
Shell Gulch
Long Gulch
Deer Creek
Moffett Creek
EAST SIDE DITCH
ISLAND RD
PATTERSON LANE
FLLER DITCH
SCOTT RIVER DITCH
T. 44 N.
T. 43 N.
T. 42 N.
R. 8 W.
R. 7 W.
R. 6 W.
R. 5 W.
R. 4 W.
R. 3 W.
CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
LEGEND
National Forest Boundary
Allenated Land within the National Forest Boundary
TOWNSHIP AND SECTION LINE CLASSIFICATION
Surveyed, Location Reliable
Surveyed, Location Approximate
Unsurveyed, Protraction
Primary Highway
Secondary Highway
Improved Light Duty
Unimproved Dirt
Trail
Locked Gate
Road, Location Approximate
U.S. Highway
State Highway
County Road
Forest Highway
Forest Road
Forest Trail
Trail, Location Approximate
KLAMATH NATIONAL FOREST
QUADRANGLE LOCATION DIAGRAM
Base map prepared by the U.S. Geological Survey
Control by USGS and USC&GS
Topography by photogrammetric methods from aerial photographs taken 1951. Field check 1954
Polyconic projection 1927 North American datum
10,000-foot grid based on California coordinate system, zone 1
1000-meter Universal Transverse Mercator grid ticks, zone 10, shown in blue
INTERIM EDITION
Modification to USGS base map prepared by the Geoметronics Service Center from 1982 aerial photography and 1983 correction guides furnished by the Pacific Southwest Region.
Landnet revised according to additional Forest Service evidence.
UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
FORT JONES SE, CALIF.
N4130-W12245/7.5
REVISED 1983
718-4C


ETNA NE QUADRANGLE
CALIFORNIA
7.5 MINUTE SERIES
SCOTT VALLEY
BM 2788
BM 2797
Complete Stock Water System
Pending
Improved Stock Water System
Improved Stock Water System
Clark Creek
Douglas Sch (Aban'd)
Flume
BM 2853
3166
3954
2820
2857
3200
4000
T. 42 N.
T. 41 N.
(ETNA NW)
4588
4586
4585
4584
25'
34
35
36
3
2
1
6
10
11
12
7

2000 Riparian Inventory

Directions: When a tree is dead, make a "X" on the dead line. When a tree is alive, make a rating from 1-5.

Tree Rating:
1 = Tree is less then 8" tall and has less then less then 3 main stems.
2 = Tree is less then 8" tall and has more then 3 main stems.
3 = Tree is over 8" tall with several stems. Tree is up to knee height with several main stems
4= Tree is over knee height with several main stems,
5 = Tree is hip height or over with several main stems.

: Location_____

Alive- _____

_____

_____

_____

_____

_____

Dead-_____

_____

_____

_____

File	STREAM NAME		Other	MWAT	Max Weekly Avg C		Max Daily Av	Peak Date	Season
Name		Year	Comments	(C)	Min	Max	Fluctuation	of MWAT	
Esc23_47	Scott River at Wilhite	1997		21	17.7	25.1	7.4	8/8/97	5/30/97-9/26/97
Esc27_07	Scott River at meamber	1997		23.1	20.1	26	5.8	8/11/97	5/30/97-9/26/97
Esc32_97	Scott River at Hwy 3	1997		22.8	18.1	28.7	10.5	7/25/97	5/30/97-9/26/97
ret01_07	Etna Crk	1997	md 6/21 on	LT	LT	LT	LT	LT	LT
rfr01_07	French Crk	1997	full series	20.7	17.9	24.8	6.8	08/10/97	5/13-10/31
rsc29_97	Eiler Ranch	1997	no data after 8/9	21.7	17.4	26.2	8.8	7/26/97	5/13-8/9
rsc36_87	Serpa Lane	1997	md 6/25-7/21	23.1	18.2	29.1	10.9	8/12/97	5/13-8/8
rsc40_77	Eller Lane	1997	md 6/25-8/2	22.1	18.6	26.7	8.1	8/11/97	5/13-10/8
rsc45_07	Below Etna Crk	1997	md 6/16-6/21	20.6	16.9	24.8	7.8	8/12/97	5/13-10/30
rsc45_27	Above Etna Crk	1997	6/22-8/09 md	20.7	16.4	26.7	10.3	8/16/97	5/13-10/30
rsc46_97	Horn Lane	1997	6/22-8/09 md	19.5	16.7	22.8	6.2	8/16/97	5/13-10/30
rsc50_77	Below French Crk	1997	full series	20.9	17.1	25.7	8.6	8/11/97	5/13-10/30
rsc50_97	Above French Crk	1997	full series	20.8	16.8	25.4	8.6	8/12/97	5/13-10/30
rsc52_67	Fay Lane	1997	full series	19.6	16.8	24.1	7.3	7/29/97	5/13-10/1
rsc55_37	Alexander	1997	AIR	AIR	AIR	AIR	AIR	AIR	AIR
rbj01_08	S. Fork @ Blue Jay	1998	full series	14.8	13.4	16.9	3.5	8/16/98	6/8-10/20
ref01_08	E.F @ Callahan	1998	out of water 7/18	14.4	11.4	18.2	6.8	7/17/98	6/8-10/20
ref02_08	E.F @ Masterson Rd	1998	full series	21.0	17.3	25.7	8.5	8/16/98	6/8-10/20
ret01_08	Etna Crk	1998	in air 7/11 - 8/8	16.3	12.8	20.7	7.9	8/15/98	6/15-10/21
rfr01_08	French Crk	1998	full series	19.7	17.6	23.6	6.0	9/7/00	6/10-10/21
rrl01_08	Rail Creek	1998	full series	16	13.9	18.8	4.9	8/17/99	6/8-10/6
rsc29_98	Eiler Ranch	1998	full series	21.1	17.6	24.9	7.4	8/15/98	6/3-10/20
rsc36_88	Serpa Lane	1998	no data	LT	LT	LT	LT	LT	LT
rsc40_78	Eller Lane	1998	buried 6/30 - 7/16	20.5	16.8	24.8	8.0	8/15/98	6/3-10/20
rsc45_08	Below Etna Crk	1998	full series	20.0	16.7	23.6	6.9	8/15/98	6/15-10/21
rsc45_28	Above Etna Crk	1998	full series	19.7	16.5	23.2	6.7	8/15/98	6/15-10/21
rsc46_98	Horn Lane	1998	no data	LT	LT	LT	LT	LT	LT
rsc50_78	Below French Crk	1998	full series	18.2	15.4	21.9	6.5	8/16/98	6/10-10/21
rsc50_98	Above French Crk	1998	full series	19.7	17.6	23.6	6.0	9/7/98	6/10-10/20
rsc52_68	Fay Lane	1998	in air 7/19 - 8/3	19.2	16.5	23.0	6.6	8/17/98	6/11-10/21
rsc55_38	Alexander	1998	in air 7/25 on	17.0	14.0	21.0	6.9	7/25/98	6/4-10/20
rsc58_08	Red Bridge	1998	in air 9/1 on	18.3	15.0	22.3	7.2	8/16/98	6/8-10/21
rsf01_08	S.F @ Baker's	1998	full series	16.3	14.2	19.0	4.8	8/16/98	6/8-10/20

MWAT = Maximum Seven Day floating Average

File Name	STREAM NAME	Year	Other Comments	MWAT (C)	Max Weekly Avg C Min	Max	Max Daily Av Fluctuation	Peak Date of MWAT	Season
rbj01_09	S. Fork @ Blue Jay	1999	full series	13.5	12.6	15.1	3.5	8/24/99	6/1-11/20
ref01_09	E.F @ Callahan	1999		19.4	15	24.5	9.5	08/05/99	6/1-11/20
ref02_09	E.F @ Masterson Rd	1999	LT	LT	LT	LT	LT	LT	LT
ret01_09	Etna Crk	1999	LT	LT	LT	LT	LT	LT	LT
rfr01_09	French Crk	1999		18.1	15.6	22.4	6.8	08/23/99	5/31-11/05
rrl01_09	Rail Creek	1999		15.1	12.5	18.6	6.1	7/16/99	6/1-11/19
rsc29_99	Eiler Ranch	1999	full series	19.9	16	24.1	8.1	08/05/99	6/1-11/19
rsc36_89	Serpa Lane	1999	full series	21	17.2	25	7.8	08/05/99	6/1-11/19
rsc40_79	Eller Lane	1999	full series	19.9	16	23.9	7.9	08/05/99	6/1-11/19
rsc45_09	Below Etna Crk	1999	LT	LT	LT	LT	LT	LT	LT
rsc45_29	Above Etna Crk	1999	LT	LT	LT	LT	LT	LT	LT
rsc46_99	Horn Lane	1999	LT	LT	LT	LT	LT	LT	LT
rsc50_79	Below French Crk	1999	full series	18.7	15.4	23.1	7.8	07/28/99	6/7-11/20
rsc50_99	Above French Crk	1999	full series	18.5	14.9	23.6	8.6	08/05/99	5/31-11/20
rsc52_69	Fay Lane	1999	LT	LT	LT	LT	LT	LT	LT
rsc55_39	Alexander	1999		19.9	16	23.9	7.9	8/5/99	6/1-11/20
rsc58_09	Red Bridge	1999	md after 9/4	17.1	14.1	20.9	6.8	8/27/99	6/1-9/5
rsf01_09	S.F @ Baker's	1999	full series	13.8	15.3	17.5	3.8	08/29/99	5/31-11/20
Esc23_49	Scott River at Wilhite	2000		19.8	16.6	23.2	6.6	7/16/00	6/1-11/8
Esc25_09		2000		19.8	16.7	23.4	6.7	8/5/00	6/1-11/8
Esc32_99	Scott River at Hwy 3	2000		21.2	17.4	25.6	8.2	8/5/00	6/1-11/8
rbj01_00	S. Fork @ Blue Jay	2000		15.4	14	17.5	3.5	08/04/00	5/12-10/09
ref01_00	E.F @ Callahan	2000		21.6	17.5	26.4	8.8	08/05/00	5/12-10/06
ref02_00	E.F @ Masterson Rd	2000		21.4	17.2	26.8	9.7	08/04/00	5/23-10/06
rfr01_00	French Crk	2000		21.1	17.7	26.6	8.9	08/10/00	5/12-10/12
rrl01_00	Rail Creek	2000	full series	17.3	14.8	20	5.2	08/04/00	5/12/10/06
rsc29_00	Eiler Ranch	2000	full series	22.5	18.3	27.2	8.9	08/05/00	5/12-10/12
rsc36_00	Serpa Lane	2000		23.6	19.1	28.4	9.3	08/05/00	5/12-10/12
rsc40_70	Eller Lane	2000	full series	22.5	18.9	26.6	7.7	08/05/00	5/13-10/13
rsc45_00	Below Etna Crk	2000	md after 9/4	20.6	16.7	25.3	8.6	08/05/00	5/26-9/3
rsc45_20	Above Etna Crk	2000	full series	17.2	15.3	19.2	3.9	07/15/00	5/26-10/20
rsc47_40	Horn Lane	2000	md may-july	19.4	16.3	23.1	6.8	08/05/00	7/17-10/18
rsc50_70	Below French Crk	2000	full series	19.1	15.6	23.5	7.9	08/03/00	5/12-10/12

rsc50_90	Above French Crk	2000	full series	19.8	16	24.6	8.6	08/03/00	5/12-10/12
rsc52_00	Fay Lane	2000	full series	20	17.6	23.7	6.1	08/09/00	5/23-10/12
File	**STREAM NAME**		**Other**	**MWAT**	**Max Weekly Avg C**		**Max Daily Av**	**Peak Date**	**Season**
Name		**Year**	**Comments**	(C)	**Min**	**Max**	**Fluctuation**	**of MWAT**	
rsc57_00	Bundy	2000	air 8/25-8/31	20.3	16.4	25.2	8.8	08/04/00	5/12-10/12
rsc58_00	Red Bridge	2000	LT	LT	LT	LT	LT	LT	LT
rsf01_00	S.F @ Baker's	2000	full series	17.3	15.2	20	4.8	08/05/00	5/12-10/09
ret01_00	Etna Crk	2000	lost temp	LT	LT	LT	LT	LT	LT

LT denotes a hobo temp was lost or stolen

Peak date of MWAT indicates week with the Maximum Weekly Average Temperature

Wood bracing along Lower Kidder Creek

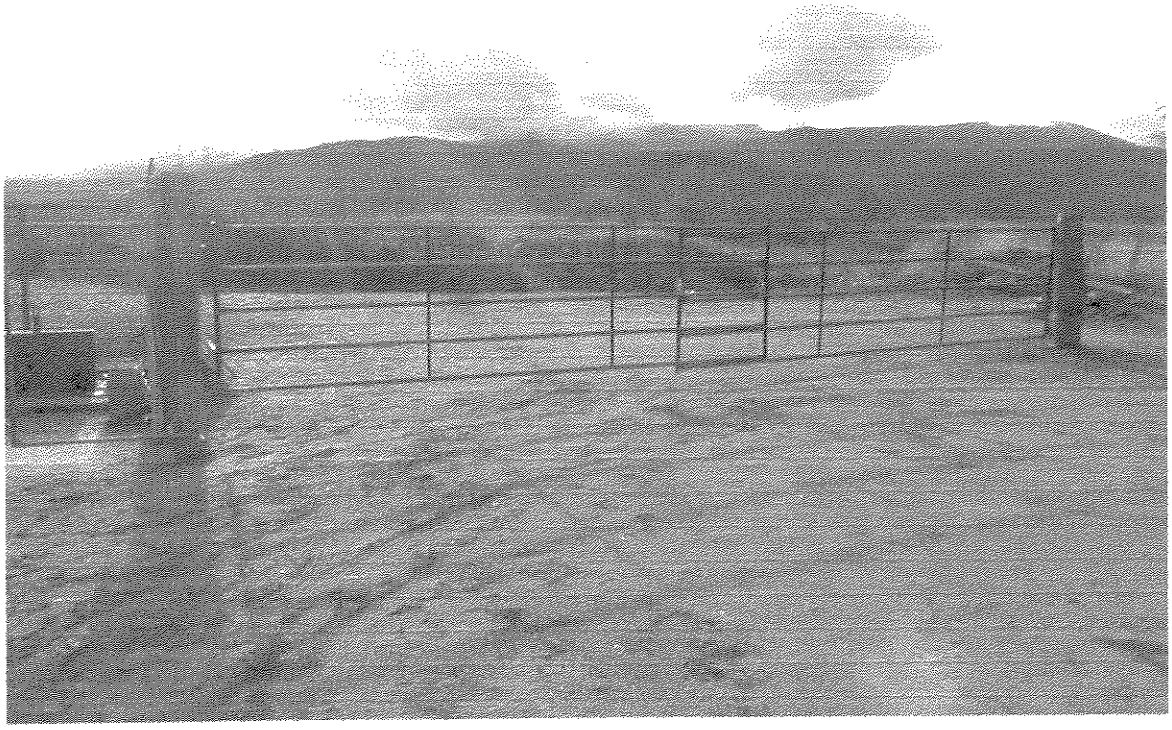
Gates at crossing on Lower Kidder Creek

Fence line constructed along Lower Kidder Creek

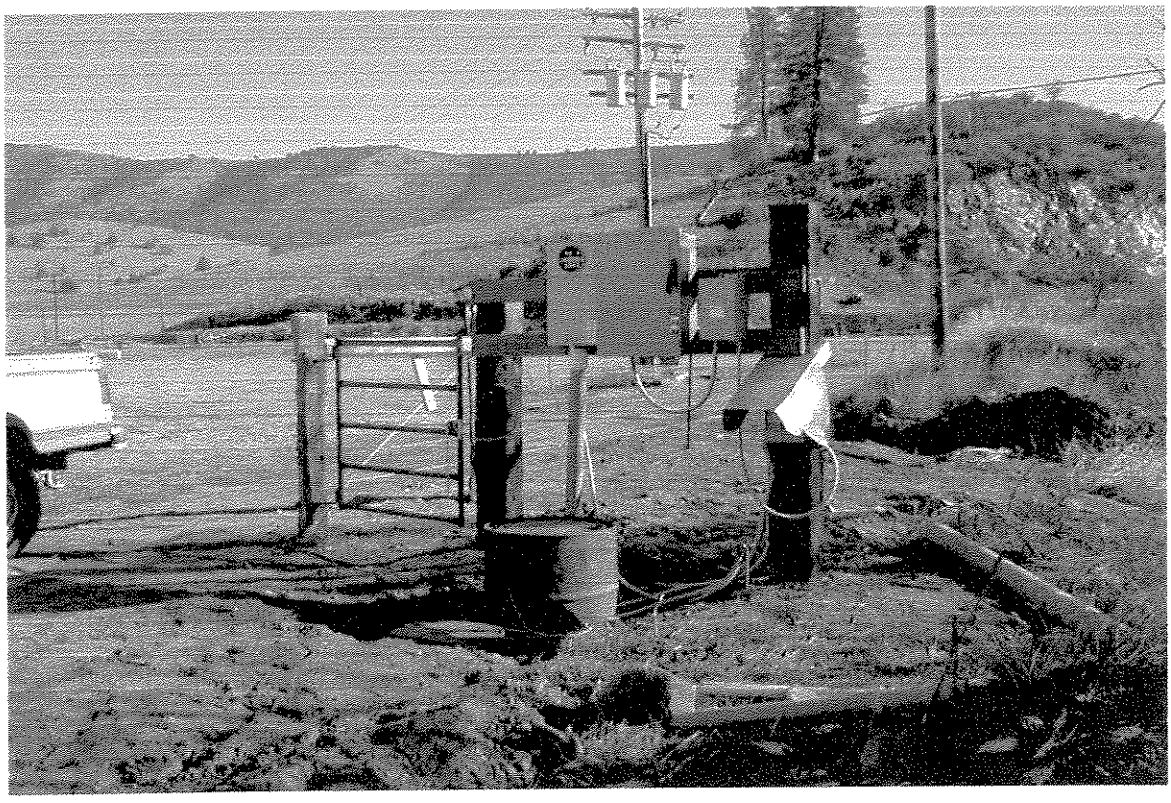
Wooden posts used along Lower Kidder Creek

Frost free hydrant for stock watering system on Scott River near Horn Lane Bridge.

Cedar bracings on livestock fence – Scott River near Horn Lane Bridge.



Livestock gates keeping animals off of the Scott River near Horn Lane Bridge.



New pump system for livestock watering – Scott River near Horn Lane Bridge.